REMARKS

I. Introduction

In response to the pending Office Action, Applicants have amended claims 1, 3, 6, 9-11, 13, 14, 16, 18, 21, 24-28, 30, 33-37 and 39 to overcome the § 112, second paragraph rejections. Support for the amendments to claims 1, 3, 6, 9-11, 13, 14, 16, 18, 21, 24-28, 30 and 33-37 can be found, for example, on pages 2, lines 30-31 and Fig. 1 of the specification. Previously withdrawn claims 40-49 have been cancelled. No new matter has been added.

For the reasons set forth below, Applicants respectfully submit that all pending claims are patentable over the cited prior art.

II. The Rejection Of Claims 1 -39 Under 35 U.S.C. § 112

Claims 1-39 were rejected under 35 U.S.C. § 112, first paragraph because the specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to practice the invention commensurate in scope with these claims. Applicants respectfully submit that the pending claims are enabled for at least the following reasons.

With regard to claims 1-5, the Examiner alleges that the specification, while being enabling for an AlN film having 4H-polytype, does not reasonably provide enablement for BInAlGaN having 4H-polytype, in that the single embodiment of AlN does not provide enablement for all of the compositions included in the scope of claim 1.

However, the details of the initial growth of 4H-AlN on 4H-SiC is described in the embodiments. Once the initial stage is completed, the consecutive 4H-polytype BInAlGaN

growth is well-known in the art for any alloy composition as long as the lattice mismatch is relatively small. Thus, no special growth conditions are required for the consecutive alloy growths. Therefore, contrary to the Examiner's assertion, no undue experimentation is required for the growth of any alloy composition.

Turning to claims 6-39, the Examiner alleges that the specification does not seem to teach how to form GaN-based epitaxial layers having a 4H-polytype structure as recited. However, the details of the inherency of the polytype in the homoepitaxial growth is mentioned in the reference paper for SiC (see, N. Kuroda et al., "Step-controlled VPE growth of SiC single crystals at low temperatures", Extended, Abstract of International Conference on Solid State Devices and Materials, Tokyo, 1987). The reference discloses, for example, that 4H-polytype AlGaN ternary alloy is easily grown by applying a Ga supply immediately after the initial 4H-AlN growth on 4H-SiC substrate by MBE (Molecular Beam Epitaxy) keeping the same growth temperature. It should be noted that it is preferable that the consecutive alloy growths are carried out by MOCVD (Metal Organic Chemical Vapor Deposition) rather than by MBE because more nitrogen species can be supplied during the MOCVD growths, as MOCVD consecutive 4H-polytype BInAlGaN growths on initial MBE-grown 4H-AlN provide for better crystal quality. As MOCVD technique is well known in the art, undue experimentation for this method would not be required to practice the invention.

Thus, as described above, the specification does sufficiently enable one of ordinary skill in the art to practice the invention. Therefore, Applicants respectfully request that the § 112, first paragraph rejection be withdrawn.

III. Conclusion

Having fully responded to all matters raised in the Office Action, Applicants submit that all claims are in condition for allowance, an indication of which is respectfully solicited.

To the extent necessary, a petition for an extension of time under 37 C.F.R. 1.136 is hereby made. Please charge any shortage in fees due in connection with the filing of this paper, including extension of time fees, to Deposit Account 500417 and please credit any excess fees to such deposit account.

Respectfully submitted,

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